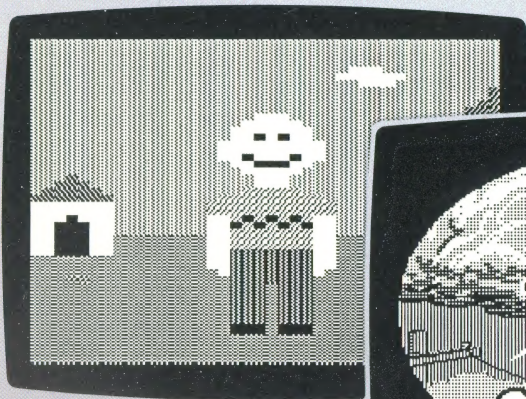


The Printographer™

Hi-Res, Double Hi-Res, and Lo-Res
Graphics Printing Package



Roger Wagner™
PUBLISHING, INC.

PrintographerTM **The Graphics Printing Utility for the Apple® II Series Computers**

by Steve Billard & John Schappert

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Chapter 1: Introduction

If you have a printer with graphics capabilities, you may have noticed that it can be more difficult to get graphics to the printer than text.

The Printographer is a program that allows you to easily print pictures from your graphics screen on your printer. The Printographer is unique as a graphic printing program in several respects:

1. Not only is it easy to use, but it prints all three graphic modes available on the Apple II, II+, IIe, IIfx, and IIGS: Lo-Res, Hi-Res, and Double Hi-Res*.
2. It can be easily configured to work with just about any printer and printer card or port.
3. Full color printing is supported on popular color printers.
4. Text can be easily added to your Hi-Res and Double Hi-Res pictures.
5. It allows you to edit pictures both horizontally and vertically, and has special cropping features for diamond and oval patterns.
6. Pictures can be printed horizontally or vertically.
7. Any portion of the picture can be magnified up to ninety-nine times.
8. Pictures can be saved to disk in either a normal or compressed format.

* Double Hi-Res graphics are not available on the Apple II or II+.

Chapter 2: Backing Up Your Disk

Before you begin, you should make a backup of The Printographer diskette to protect yourself from wandering electrons in the night. This diskette is not copy protected. Any copy program that can copy a whole disk, like the ProDOS 8 Filer or Copy II+, can be used to make your backup.

Then put that original somewhere far away and safe. Follow through the rest of this section with the backup. Anywhere within the rest of this manual where it mentions "The Printographer" use this new backup – not the original.

Chapter 3: Configuring Your Disk

The following pages detail how to produce your first graphics printout using The Printographer, and also the many options available in this package.

When you start the disk the first time, it will automatically run a program called Configure. This program will ask the following questions:

I. "Choose your printer:"

The screen will display a list of printers. If you do not see your printer listed on the screen, use your arrow keys (or the mouse) to move the inverse bar among the printers. When you see your printer highlighted, press Return (or click the mouse button) and skip ahead to item II, below.

If you do not see your exact printer listed by name (and model), choose one that seems the most appropriate. For example, if you had an Epson ZZ99 (They don't make one of these...yet), it might not appear in the list of printers. However, quite a number of Epson printers are listed. Epson, like most printer companies, tries to make all their printers function in a similar way when printing graphics. Thus, although many printers are listed, choosing any of the printers under that manufacturer's name may work.

Another possibility is that your printer is functionally equivalent to a printer made by another manufacturer. The two most common black and white printers emulated are the Apple ImageWriter and the Epson FX80. If your printer is a color printer, you may want to try the Apple ImageWriter II or the Epson JX80. Your printer manual or dealer may also be able to tell you if your printer is equivalent to an ImageWriter, Epson, or other popular printer.

Note: If you have a 64K Apple (Apple II/II+ or 64K IIe) and want to print Lo-Res graphics in color, you will have to configure a copy of The Printographer just for this purpose. In configuring the disk for this, find the name of your printer that ends in the letters ".LC" (for Lo-Res Color) and choose it instead of the usual name. You will still want to configure a second copy of The Printographer disk for Hi-Res printouts in color or black & white. This step is *only* required for Lo-Res printouts in color.

II. If the printer you've selected can print in color, that is, uses a multi-color ribbon, the program will next ask **"Do you have a color ribbon?"** If your printer is not equipped for color, skip to III, below.

If you do not want to print in color, press "N" (for No) and press Return. Otherwise, press "Y" (for Yes) and Return. You can also use the mouse here. Selecting color when you have a black ribbon won't hurt anything, but the printouts will take longer as The Printographer repeats each pass of the printhead for the ribbon colors it thinks are there, and the printout will not be as clear.

If you *do* have a color ribbon, you may want to make and configure *two* copies of The Printographer; one for when you're using the color ribbon, and one for when you're using the black ribbon.

III. Depending on your printer type, the program may now ask **"Does your printer need line feeds?"** This refers to whether or not your printer automatically does a line feed with every carriage Return. If this question is asked and you are not sure, press "N" (for No) and Return. This is the most common setting. Later, if the printer is printing all the picture on a single line, run Configure again and answer "Y" (for Yes) here. See *Reconfiguring The Printographer* for details on how to run Configure again.

IV. For all printers, the program will now ask **"Enter width of paper in inches:"** For standard printer paper, press "8" and Return. If you are using a wide carriage printer, a value of "12" may be more appropriate.

IV. "Choose your printer interface:"

This may be difficult to answer, especially if you did not set up your computer originally, but it is an essential piece of information for The Printographer.

If you have an Apple II, II+, or IIe, your printer is attached to the computer by means of a cable and a printer card. This card has the name of a manufacturer, and possibly a model name and/or number, on it. If you do not already know the model and manufacturer of your printer card, you will have to turn off the computer, remove the cover, and examine the card, or ask someone who knows.

If you have an Apple IIc, the "card" is built into the printer port, so you can just select "Apple IIc Printer Port" on the first display screen. Note: The option for the Modem Port is only for those people with two printers.

If you have an Apple IIGS, there are three possibilities. If you are using the built-in printer port, select "Apple IIGS Printer Port" as the printer card. This also offers the Apple IIGS Modem Port for those people with two printers. Or, if you have an Apple IIGS with your own printer card, and have configured the Control Panel for "Your Card", select the printer card model and manufacturer as described above for Apple II, II+, and IIE owners.

V. "Enter Printer Card Slot Number (1..7)"

Unless you have deliberately set up your printer in an unusual slot configuration, enter "1" and press Return.

You're done!

Now that you have answered the various questions, the disk will come on for a while as the information is saved on the diskette, and then The Printographer itself will start automatically. Now you're ready to print graphics!

Ordinarily, you will never have to run Configure again, and whenever you start The Printographer disk, The Printographer will appear instead of the Configure program.

A Short Test

Before discussing The Printographer's options, you should try a simple printout to make sure everything has been properly configured. When the Configure program has finished, you will see The Printographer's Main Menu. Turn on your printer and follow these short steps exactly as shown:

1. We'll start with a picture already stored on The Printographer disk. Because the front side of The Printographer disk is completely filled with files needed for configuring your printer, the sample graphics pictures have been put on the back side of the disk. To load these pictures, first remove the disk from the drive and put it back with Side 2 facing up.

2. With the highlight bar on "Load picture from disk", press Return.
3. The Printographer will now show you a list of the subdirectories or "folders" on the back of the disk. The one named PICTURES is the one you want. Now highlight the PICTURES directory and press Return.
4. A list of the pictures on the disk appears. With the highlight bar on the picture called MAGNETIC.DISKS, press Return.
5. The picture appears briefly, and then is replaced by the Main Menu. Just for fun, let's move down the Main Menu to highlight the "View current picture" and press Return. This gives us a little more time to admire our graphic. Press any key to get back to the Main Menu.
6. Since this is a test of your printer, move the highlighted bar down to "Print current picture" and press Return.
7. The Picture Printing menu appears. Press Return alone to accept each of the defaults shown (NORMAL, MAGNIFY 1, HORIZONTAL, and CENTER). We'll explain these in more detail later.

The printing begins. You can stop the printing by pressing Escape to return to the Print Menu, or by pressing Control-Reset if the program or the printer "locks up".

Note: If you are printing in color, certain parts of the picture, in particular text, may print with "color fringes." This is due to the inherent design of the Apple II graphics display, and cannot be avoided. The Printographer has special procedures to minimize the problem, but can't totally prevent it in all situations.

Reconfiguring The Printographer

If, after this test, you suspect you have not configured your disk properly, or if you wish to change printers later on, the Configure program can be run by starting up the front side of The Printographer disk and pressing the "C" key (for Configure) as soon as the red disk drive light comes on. If you wait too long, Configure will be skipped and The Printographer will run instead. If this happens, try starting again and press "C" a little more quickly.

Putting The Printographer on Other Disks (Hard Disks, Ram Disks, etc.)

The easiest way to get The Printographer on another device is to create a subdirectory of the name "Printographer", and then copy everything from The Printographer disk (subdirectories and all) onto your hard disk. Then set up your program selector to run the BAS (Applesoft BASIC) file called STARTUP. This will then work exactly like booting the disk – pressing "C" will get you the Configure program and "L" will get you the Lo-Res Converter.

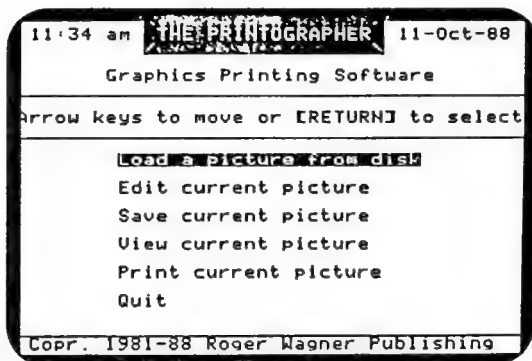
Sometimes it's important, perhaps for reasons of space, to only move those files that are of vital importance to The Printographer. Only the files PRINTOGRAPHER and PRINT.GRAPHICS need to be in the same subdirectory, and you can set up your file selector to run the SYS file PRINTOGRAPHER. If you need to add text to the picture you're working on, you may want to add the FONT subdirectory, so The Printographer can find them. Since The Printographer starts up with two default character sets, this may not be needed.

Moving CONFIGURE is a bit more difficult. Since it sets up your system for you, it needs a lot of file access. The files CONFIG.VARS and CONFIG.DRIVER get it going. But all the data it requires to create the file PRINT.GRAPHIC from is in the subdirectories PRINTERS and DRIVERS. It also accesses the files LOW.TO.HIGH and LO.TO.HI.DEN and LO.TO.HI.COL. After all that it quits by executing PRINTOGRAPHER.

LOW.CONVERTER is easy to move, though. Only the files LOW.TO.HIGH and COMPRESS absolutely have to be in the same subdirectory as LOW.CONVERTER. However, LOW.CONVERTER does load a blank screen when you start it up, so you may also want to put the files UNCOMPRESS and LOHIGH.PIC in the directory with LOW.CONVERTER as well. These two files are skipped by LOW.CONVERTER if they are not found, though, so they can be omitted with no ill effect.

Chapter 4: The Main Menu

This part of the manual explains The Printographer in more detail. When The Printographer is run, the following Main Menu appears:



Menu items in the menu can be selected using the arrow keys and Return key, or the mouse. You can also press just the first letter of each menu choice ("L" for Load, for example.)

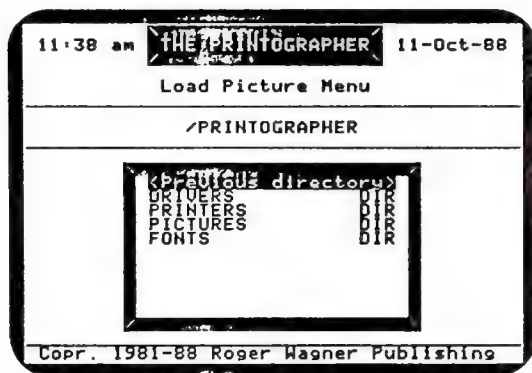
Load A Picture From Disk

To load a picture from the diskette, remove The Printographer diskette from the disk drive, if necessary, and insert the ProDOS disk that you used when saving that picture. If you don't have a disk with a picture handy right now, use the *back* of The Printographer disk. We've placed several sample pictures in there so you can try things out.

1. First, place the diskette with your picture on it in the drive. Then make sure the highlighted bar is on "Load a picture from disk", as is shown in the illustration above, and press Return.

Note: If you have more than 1 drive, you can put your picture diskette in the additional drive. Selecting the <Previous directory> choice, immediately after choosing Load a picture, will bring you a list of all your other disk drives, listed by slot and drive. Highlight the appropriate slot and/or drive number (usually SLOT 6, DRIVE 2) and press Return to see a catalog of that diskette.

3. The disk drive will now come on as The Printographer reads the diskette directory. A list of any graphics that have been saved on that diskette soon appears. If you are using the back of The Printographer diskette, the screen will look something like this:



Use the arrow keys or mouse to select the PICTURES directory (indicated by the letters DIR to the right of the name), and then press Return or click the mouse.

The Printographer disk comes with several pictures on it. By pressing the arrow keys, the inverse bar will move down the screen over the filenames. When you get to the one you want, press Return and the picture will be loaded into memory.

If there are no pictures on the disk, only the phrase "<Previous directory>" will be highlighted at the top of the screen. Use this to back out of the last subdirectory you examined or, if you're back at the main directory, use this to activate the online function where you can insert another diskette and indicate the slot to be cataloged.

When the filenames of the picture on the disk are shown, there is an indication to the right of each name as to whether the picture is a Hi-Res or Double Hi-Res picture. The Printographer will load either type. This filetype is shown mainly as a convenience.

Note: The Printographer will not directly load a Lo-Res picture. Lo-Res Pictures must be converted first. See the section on the Lo-Res Converter, later in this manual, for more details.

If you want to return to the Main Menu, you can press the Escape key. For now, use the arrow keys to select your picture and press Return.

The picture will then be loaded, quickly displayed, and the Main Menu reappears. If the picture on the screen is not the one you wanted, try again.

IMPORTANT NOTE: At virtually all stages of The Printographer's operation, pressing the Escape key will return you to the previous menu level. To exit The Printographer, use the Escape key to back up to the Main Menu, then choose Quit. This will return to any program selector such as the Finder, DeskTop, ProSel, etc.

Edit current picture

Choosing this option from the Main Menu brings up a second menu called the Crop Menu. The Crop Menu is a help screen that displays all possible keypresses that you can use during editing. Pressing Return once again gets you past this menu to see your graphic. And, while looking at your picture, you can get back to the Crop Menu at any time by pressing the help key "?".

One of the more useful features of The Printographer is its ability to print just part of a picture by "cropping" the picture to any size you desire.

You'll notice there are little blinking "L" shaped markers in the upper left hand corner and lower right hand corner. These are the "crop markers."

Either crop marker can be activated by pressing the Space Bar. You will notice that initially the top marker is flashing at a faster rate than the bottom marker. When the Space Bar is pressed, the bottom marker will blink faster. You can always tell which marker is active by noting which marker is flashing faster.

To move the marker, use the arrow keys. The marker can move up, left, right or down, unless its at the edge of the screen. The Printographer will beep when you have reached the limit of a given direction.

NOTE: On the Apple II or II+, you can use the keys I, J, K, and M as directional keys. To repeat, you'll have to use the REPEAT key. And the IIGS can use the mouse to move the crop marks. Clicking the mouse button switches between the top and bottom crop markers.

To move the markers 10 screen lines at a time, press the F (for Fast) key once. This places you in a larger cropping increment. The picture will now be cropped by 10 units each time the directional keys are pressed or the mouse is moved. Pressing any key other than the arrow keys (or I, J, K, or M) will release this function and return the cropping increment to the normal mode.

As the markers are moved, parts of the picture are cut out. Practice moving the markers to see how easily cropping is done. If you should crop too far, simply reverse your direction and the picture will be restored, one line (or 10) at a time.

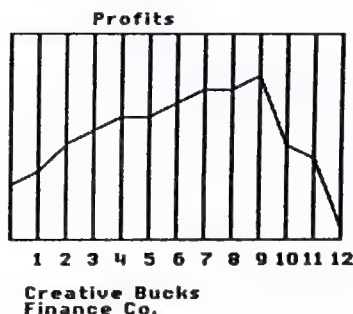
Pressing the R key (for Restore) can also be used to restore the complete original picture to the screen.

If at any time you should wish to return to the Picture Cropping menu, simply press the question mark key (?). It is not necessary to press the shift key to use this feature.

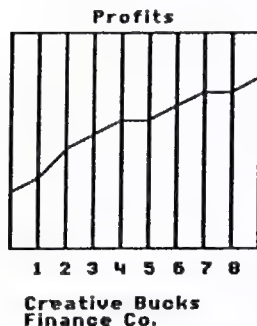
If for any reason you wish to load a new Hi-Res or Double Hi-Res picture without printing the one you are currently working on, you may press Escape to return to the Main Menu.

Program Tip: Both the Restore and the backing up features of the cropping function may erase text you have just added. If you have just added something you don't want to lose by "restoring the original", use Escape to go back to the Main Menu. Then go back to cropping via the "Edit current picture" option. The reason for this? The version you see of the screen is the "working" version. The "original" of your picture is updated in memory only when you go back to the Main Menu. Now cropping and restore will work exactly the way you expect them to. When you move the crop markers, the area outside the crop markers is not printed.

Before cropping...



After!

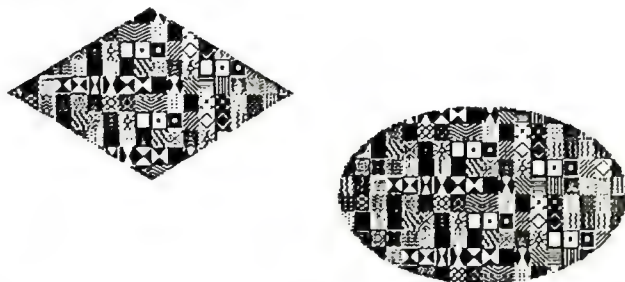


As you can see, cropping can be quite useful!

Diamond and Oval Cropping

Another unique feature of Printographer is "diamond" and "oval" cropping. Just press D or O and your picture will be cropped in a diamond or oval shape.

The diamond or oval pattern is always done within the current crop marks. Thus, if you want a small oval, crop first with the Top and Bottom markers, then press O to finish the cropping.



A word about the background here. You may notice when you crop the Raven picture, or others, in the diamond or oval pattern, that the cropped area is filled in with white, rather than black. This is not an error. When printing the Raven picture, white on the screen is not printed on the printer; only the black areas are printed. Thus, to get the true diamond or oval cropping, white must be filled in around the picture. For a picture being printed in the inverse mode (that is, black and white are reversed, as would be done for the PLOTTER picture), diamond and oval cropping fill the cropped area in black. In the inverse mode, black areas are not printed, and only the white dots are printed on the paper.

The Printographer will try to automatically determine whether to fill in the oval or diamond mask with black or white according to its determined Inverse or Normal setting (see the section later on the meaning of these terms). However, if you want to change the color that the diamond and oval cropping uses, just press the B key (for background) to switch to the opposite fill color, and press the D or O to re-crop the picture in the diamond or oval pattern. If you change your mind, just press B again, and re-crop one more. Each time you press the B key, the background color used in the next pattern crop will alternate between black and white.

Flip a Picture

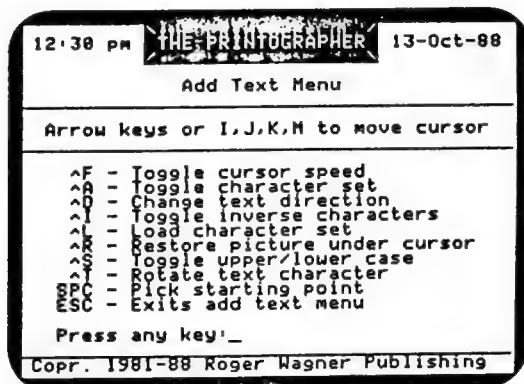
When printing a picture vertically, you may, for some reason want the "top" of the picture to be on the right side of the paper as the picture comes out of the printer, rather than the left side as would normally be the case. To accomplish this, you can "flip" the picture upside-down before printing it. Just press **X** to flip it once. If the result isn't to you're liking, press **X** to flip it again and you'll be back where you started! No need to use the **R** key to restore it.

Adding Text to Pictures

In addition to cropping pictures, The Printographer also provides the ability to add Hi-Res or Double Hi-Res text in a variety of interesting type styles (fonts) to your pictures.

To start the typing mode, press the **A** key (for "Add Text") key from the Cropping Menu or while editing the picture.

When you press this key, you will be transferred to the Add Text Menu:



When you press any key, you'll leave this menu and be returned to a display of your picture. But, instead of the crop markers, you'll see a single "box" cursor in the center of your screen. This is the position cursor for the text annotation mode. For directional control, you can use either the mouse, the arrow keys, or (on an Apple II or II+), the I, J, K, M keys.

When you first start the positioning cursor, it moves in a "fast" mode that corresponds to 24 lines of either 40 (Hi-Res) or 80 (Double Hi-Res) characters per line. This positions text in fixed locations that are easily edited if you decide to change text on the screen at a later time. However, if you want dot-by-dot control over the positioning cursor, just press Control-F once. The cursor will now move just one dot for each keypress. Pressing Control-F again resumes the large movement mode.

To add text to a picture, you would first position the box cursor at the point in your picture at which you wish the added text to begin. Then press the spacebar to accept this screen position. When you press the spacebar, the cursor will change to a block cursor with a greater-than sign ">" and a small dot.

The ">" symbol is used as an indicator of which direction the cursor will move as each new letter of text is entered. Pressing Control-D will change the direction of this indicator. Thus, although you would normally enter text left to right by pressing Control-D, you can direct the line of text to go in various vertical or horizontal directions on the screen. Try it now to see how the indicator moves with each keypress.

The small dot within the block cursor indicates the orientation that each character will have as it is added to the screen. The dot indicates where the top of each letter will be positioned on the screen. Pressing Control-T will "turn" this dot, and thus the characters, each time it is pressed.

For example, if you wanted to add a vertical label to a chart, you would position the cursor next to the vertical axis in the chart, near the top of the screen. You would then press spacebar to start typing, then Control-D once to change the direction to "down".

Experiment with each of these commands as you type the text. If you want to "erase" any text added, you can back up over the spot you want to fix and press Control-R to restore the original graphics under the cursor. The area will be restored, and the cursor will move one position in the direction of the ">" indicator.

There are three options available while adding text to alter the nature of the text itself. You can press Control-I (for Inverse) to produce the inverse of each character. If you press Control-I again, it will revert to its original "normal" status.

If you have an Apple II/II+, and don't have a functional shift key, you can use Control-S (for Shift) to switch between upper and lower case text.

Control-A (for Alternate) is used to switch to the "alternate" character set. The Printographer always maintains *two* character sets in memory during the program. Each time you press Control-A, it switches from one set to the other. If you press Control-A now, and then type some letters, the text will appear as bolder characters: The FLOW font. Press Control-A again to go back to the original character set.

There are about 20 extra character sets provided in the FONTS directory on The Printographer diskette, and these can be loaded at any time by pressing the Control-L (for Load) key. Once you find the subdirectory, you'll see the list of Alternate Character Sets. Use the arrow keys to select the set you want, and then press Return to load the set. When the load is completed, you will be returned to the add text mode with the cursor in your original location. Remember to press Control-A to switch to the alternate character set.

When you are ready to print your picture, or otherwise end the addition of text, just press Escape to exit the annotation mode.

As a functional note, the Apple color graphics display system is subject to color distortion when you try to place text next to certain colors. This distortion is virtually impossible to prevent, although all possible steps have been taken within The Printographer software to avoid it.

You can minimize color distortion by putting a blank space at the beginning and end of any text you add to the screen, using the Control-R function sparingly, and by judicious use of the proper background via the Control-I command. The text itself will always have a multi-colored appearance on a color monitor, and in a color printout. Text always looks best in a black and white printout.

Saving the Current Picture

Generally, your picture will already be on a diskette. However, should you want to keep the edited image, you will want to save the new image to disk. The Printographer offers both a "Normal" picture mode that saves pictures in a standard "BIN" (for Binary) file, and a special "Compressed" picture mode that stores up to 4 times as many pictures per disk.

To save a picture, simply choose "Save current picture" from the Main Menu and the Save Picture Menu appears. A list of possible subdirectories will first appear. You can choose one of them by pressing Return on it. That makes it show any subdirectories within it. To save your file at this level, choose "Select directory" and press Return.

You will be given a choice to save your files as a "compressed" or "normal" file. Use the arrow keys to change the selection. In general, it is best to save your file in the "compressed" version since it takes nothing from your graphics and saves a good deal of disk space. Note: the ProDOS filetype for compressed files is \$08 (FOT). Compressed Hi-Res pictures have an auxtype of \$8001, Double Hi-Res pictures have an auxtype of \$8002.

Be aware that whenever you save a picture, you should use a diskette other than The Printographer diskette, since little room for new files is available on that diskette.

NOTE: Compressed pictures cannot be loaded back into other drawing programs. If you plan to do some more work on your picture with another program such as MousePaint, Dazzle Draw, 8/16 Paint, etc., it would probably be a good idea to save it using the "Normal" save option.

You don't need to worry, though. You can always reverse your decision. If you have saved a picture as a compressed file, and then want to load it back into another program, just use The Printographer's load a picture function to load the compressed picture, and then re-save it under a new name in the "Normal" format.

PROGRAM TIP: You can use The Printographer's picture Load and Save commands to move Hi-Res or Double Hi-Res pictures from one disk to another. To move a picture, just start up The Printographer disk. Then insert the disk with the picture on it, and load the picture you want to move. Now, instead of printing it, just insert the destination diskette, and save the picture on the new disk.

Remember to consider whether you'll want to load that picture into a different program when deciding whether to use the "Compress" option or not. "Normal" is best if you'll be using programs other than The Printographer with that picture; "Compressed" is best for putting the most pictures on a disk.

View Current Picture

Use this option from the Main Menu to see your already-loaded graphic. This is most useful when you want to view your picture without any flickering boxes or flashing cropping marks.

If you choose this with no picture in memory, The Printographer displays the message "No Picture Loaded".

Pressing any key will return you to the Main Menu.

Print Current Picture

Printing a picture is easy. Just choose the "Print current picture" from the Main Menu. The Print Menu appears to give you a set of options for printing your picture. You can use the arrow keys or the mouse to change a selection, then press Return or click the mouse button to accept it.

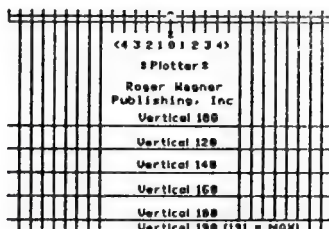
If you want to re-print a picture with different values, just press any key other than Escape or Control-S (for "Stop") during the print process to let The Printographer know you want to make changes and print again. Pressing Escape will cause the printing to stop after the next line is printed and return you to the Print Menu. Pressing Control-S will temporarily pause the printing. This is handy for changing ribbons, inserting paper, and making other printer adjustments. Pressing any other key during printout will return you to the Print Menu when the printout is done. Normally, you'll automatically be returned to the Main Menu when printing is finished, but by pressing a key such as the spacebar during the printout, you'll be returned to the Print Menu where you can try a different magnification, or other changes to the print settings.

If the printer does not start printing, the picture prints as random patterns, or anything else that makes you think the printer is not being properly run by The Printograph, you should probably re-configure The Printograph disk. See the instructions at the beginning of this manual for configuring the disk.

Assuming the picture printed properly, you can experiment with some of the print options. Whenever you make a selection, remember to press Return to accept it and move to the next question. Let's examine each one.

NORMAL/INVERSE. This is used to select how the black and white areas on the screen will be interpreted when printed. Selecting **NORMAL** means that the printout will be identical to the screen.

That is, black on the screen will be printed black by the printer, leaving the white areas on the screen unprinted so as to appear white (or whatever color your paper is). However, for text on the graphic screen, this may not be desirable. For example, by choosing **INVERSE**, black and white will be reversed so that white letters on the screen will come out printed black on the paper. The following two examples of the **RAVEN** screen illustrate this:

NORMAL**INVERSE**

If you're worried about knowing when to choose which mode, don't be! The Printograph looks at the picture and decides what is background and what is the main image desired and automatically sets the default to **NORMAL** or **INVERSE**, giving the background in white (on paper) and the main image in black just as in printing text. Many pictures will use 'Inverse' as the default.

If, either before or after doing a printout, you want to use the other setting, you can change the NORMAL/INVERSE option by simply pressing the arrow keys in the Print Menu. The program makes the necessary switch. Experiment with this option to see the different effects. If you have a color printer, only black and white will be reversed. All actual colors will remain unchanged.

MAGNIFICATION. The next choice is to magnify your picture from 1 to 99 times. Both dot matrix and daisy-wheel printers use little dots to print pictures, and depending on the size of the pins or periods used to make the dots your picture will be of different sizes. On daisy wheel printers, the pictures are relatively large compared to dot matrix printers.

Depending on your printer, you probably won't be able to magnify the *entire* picture more than 3 or 4 times. The main reason for using a larger magnification value is when you are printing just a *portion* of a picture, and want that portion to fill a large part of the printed page. See Cropping the Picture for more details.

The other use for magnification is for printing banners. That also is discussed later in this manual.

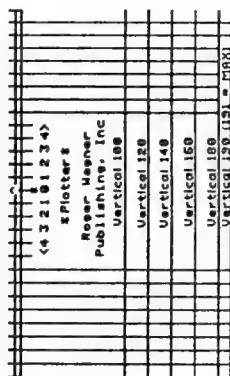
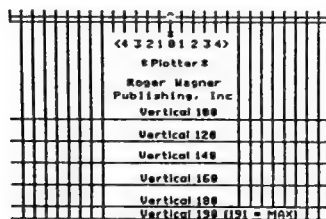
The following illustration shows the graphic letter "A" printed in different magnifications. The greater the magnification, the "chunkier" the printout because there are more dots used to create the same image. (However, if you stand on the other side of the room, the magnified letters look fine...)



For Epson printers, a magnification of at least 2' is probably what you'll want. On the ImageWriter, size '1' is usually a good choice.

Remember that magnification only enlarges what is already on the screen. It does not reveal greater detail, since that detail is not there in the first place.

HORIZONTAL/VERTICAL. This option allows you to print your graphics either horizontally (the way we normally look at something) or vertically (which looks "sideways" on the printer). As a rule of thumb, on most printers using 8 1/2 inch wide paper, a magnification factor of 3 will fill up a printed page from side to side. Anything over 3 will be truncated; so if your image fills the horizontal screen of your monitor, and you want the entire image printed at 4 or greater, choose Vertical positioning on your paper or crop the picture so it will fit. Again, some experimentation may be necessary to achieve the desired results. The following examples show both horizontal and vertical positioning:



You'll also notice that in the illustration, the horizontal printout has a different height-to-width ratio (called the "aspect ratio"). This is related to the fact that pixels on the Apple screen are not square. In addition, the difference between horizontal and vertical printouts varies by printer, and is related to the printhead design.

WARNING: Since the final image varies from printer to printer, The Printographer does not check to see if the magnification you have selected is larger than the paper in your printer. If you specify an image that is too large, the results will vary depending on your printer. Some printers just ignore the extra area, others will beep, or just lock up. If your printer locks up, press Control-Reset to get back to Main Menu, and then try a smaller magnification value, or try "Vertical" positioning.

PICTURE POSITIONING. Using The Printographer, it is possible to place your image anywhere you want horizontally on your paper. There are four options for this positioning. Press the arrow keys to move the highlight bar to the choice you prefer. These options behave as follows:

LEFT/CENTER/RIGHT

Selecting anyone of these options positions the picture in that area of the page. Selecting **LEFT** will cause the picture to be printed at the left edge of the paper. **CENTER** will print the picture centered on the page. **RIGHT** will print the picture with the right edge of the picture aligned with the right margin of the paper.

INDENT

This option allows you to specify the left margin indentation of your picture. You may specify 0 to 999 pixels. Specifying '0' is equivalent to left justification. To help you in any experiments with precise dot positioning, a picture called **PLOTTER** has been included on The Printographer diskette.

You can first print the **PLOTTER** picture at whatever magnification you think you'll be using most often, then use the vertical lines as a gauge for positioning pictures if need be. Each vertical line is 10 "pixels" apart.

Note: The only time you would want to use the Indent feature is if you had to place a picture on a page in an exact left-to-right position.



Chapter 5: Special Features

Banners and Signs

A simple sign or banner can be printed by using the Hi-Res picture called "BLANK.SCREEN" from the back of The Printographer disk .

To create your message, just load BLANK.SCREEN, press "A" for "Add Text", and then type your message in the middle of the screen in whatever fonts you'd like. When you're finished, press Escape to go back to the Picture Cropping menu.

Now use the crop markers to reduce the area printed to the smallest area possible that still includes your message (see illustration below).



Now, from the Main Menu, go to Print Current Picture.

If you're designing a sign, you can print the screen at a magnification of 4 to 10, either horizontally or vertically, and center-justified, depending on how you want the sign to look.

If you want to make a banner, you should only have 1 or 2 lines of text on the screen, and you can print it vertically, center-justified at a magnification of 8 to 15. Each printer prints at a different size, so you may have to experiment to determine the magnification you like best.

Lo-Res Pictures

Although The Printographer's main purpose is to print pictures created in Hi-Res or Double Hi-Res, a special program has been included to print Lo-Res pictures as well. Many times in a classroom situation, Lo-Res graphics provide an easy and rewarding way of teaching BASIC programming. The only problem has been, previously, how to print the final creations?

Printing Lo-Res pictures can be complicated by a number of problems:

1. Unlike the Hi-Res screen, the Lo-Res screen is actually the same screen used for text display. Thus, if you press RESET, type TEXT, or in any way disturb the image on the screen before saving it, the picture will be lost in the process.
2. Although there are 16 colors on the screen, there are only 4 actual gray levels on a black & white monitor. When printing a picture in The Printographer, different patterns are used to help distinguish the different "colors", and make the final printout as close to a black & white display as possible.
3. The Lo-Res image must be converted to a Hi-Res or Double Hi-Res graphic before The Printographer can print it. There's not a problem with this, unless you have an Apple II+ or an Apple IIe with only 64K. These machines don't have the capability of doing Double Hi-Res, so the Lo-Res converter changes them to normal Hi-Res. The bad side-effect of this is that, in normal Hi-Res, there is only six colors; so some assumptions and special techniques must be used.

The Printographer addresses all of these problems, but you'll need to save the Lo-Res picture first.

Saving Lo-Res Pictures

To avoid losing your masterpiece, save your Lo-Res picture right after you've created it. Add this line to the Applesoft program that creates the picture:

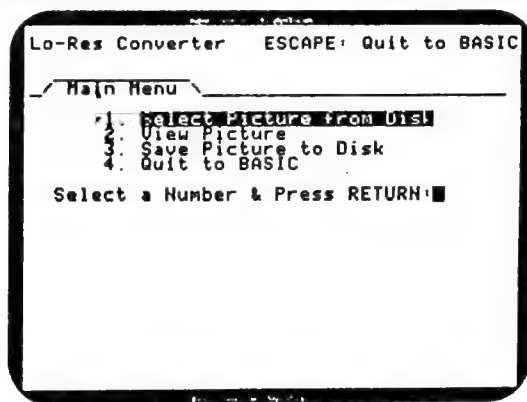
```
9999 PRINT CHR$(4); "BSAVE PICTURE, A$400, L$3F8"
```

This will save the Lo-Res picture at the point this line is executed. It does not have to be line number 9999, but it can only be executed *after* the complete picture is drawn. Placing this line at the very end of your program might be a good choice. In the example, "PICTURE" is used as the name to save the picture under. However, you can any other legal file name in ProDOS.

Lo-Res Converter

Once the picture is saved, the next step in your printing of a Lo-Res graphic is to convert it from Lo-Res to Hi-Res or Double Hi-Res so The Printographer will recognize it. For this, you can use the special program called "LOW.CONVERTER" included on The Printographer disk.

To run LOW.CONVERTER, start The Printographer diskette, and when the red drive light first comes on, press the "L" (for "Lo-Res") key. Instead of The Printographer, the Lo-Res Converter main screen appears.



Now, remove The Printographer from the disk drive and insert the ProDOS disk with the Lo-Res picture saved on it. If you don't have one handy, just use side 2 of The Printographer disk for now; several Lo-Res pictures have been included for your use in the PICTURES subdirectory.

Low.Converter will display a list of all the accessible drives. Select the name of the disk your data is saved on (Printographer, if you're using our picture). Now Low.Converter shows all the files in the main directory on that diskette. For now, ignore "Set This Prefix". This will be important when it comes time to save your picture.

Use the arrow keys to choose the file you want (or the subdirectory PICTURES, if you're loading one of our pictures). Then you can choose the picture you want, and press Return.

The disk will come on as the picture is loaded, converted to Hi-Res (on the Apple II+) or Double Hi-Res (on the Apple IIc, IIGS, or IIe), and then you will be returned to the Main Menu.

The next option on the menu is View Picture. This is especially useful when you want to be sure that the picture you named was the one you thought it was. If not, go ahead and load a different one.

If this is the picture you want, you need to save it. The third item on the menu, "Saving a picture", takes care of that. Selecting this displays a catalog of the diskette and lets you type in a name to save the new version of your picture. If this isn't the subdirectory you want to save that file in, press Escape to get back to the Main Menu.

Under ProDOS, each disk is identified by its name, and only one name is active at any given time. To save the files to a different disk or subdirectory, you must first "Set The Prefix." This is done by choosing the "Select Picture from Disk" menu item (even if you're not really ready to load a file yet!). Choose the disk you want to access, and find the subdirectory you want to save the file in. Then, instead of loading a file, choose "Set This Prefix". This sets up ProDOS to remember exactly where you want to save that file and returns you to the Main Menu.

Now go ahead and save that file. Choose "Save Picture to Disk", and enter your file's new name. Instantly, Low.Converter asks you whether you want this compressed or not. Once done with that, it will try to save the file.

Should you get the message "Syntax Error", Low.Converter is telling you that your filename wasn't correct for ProDOS. ProDOS is pretty picky. The filename can only be up to 15 letters long, and the first character must be a letter. Any characters after that can be either letters, numbers, or periods. Spaces, and special characters (like "-") are not allowed.

Once saved, your converted Lo-Res picture can now be loaded by The Printographer.

Cropping Lo-Res Pictures

In many cases, the bottom part of a Lo-Res picture will have a number of gray lines across it. This is because most pictures are done with the "GR" command in BASIC, which reserves 4 lines for text at the bottom of the screen.

To remove the gray lines, press Space Bar until you activate the crop marker at the bottom of the screen, and then press the "up" arrow key until the gray lines are removed.

When the picture looks the way you want it, press "P" to go back to the Main Menu and choose the print file option. If you have a black and white printer, you can now print the picture as you would any other Hi-Res picture, using the Normal/Inverse, Magnification, etc. settings that you prefer.

PROGRAM TIP: There is a poke you can add to your BASIC program that will eliminate the problem with the four lines at the bottom of the Lo-Res Picture. Start the graphics mode in your program with this line instead:

```
1 GR: POKE 49234,0
```

This will give you the full-screen Lo-Res graphics mode, thus avoiding the gray lines at the bottom after conversion to Hi-Res. However, the disadvantage is that you cannot see any text at the bottom of the Lo-Res screen while in the full-screen Lo-Res graphics mode.



Appendix A: The Printographer Character Sets

The following illustrations show the character sets included with The Printographer.

The ASCII.SET (not shown) is the primary character set and is always present in The Printographer. The other sets are all loaded with the Control-L command in the Picture Annotation mode.

BLIPPO BLACK.SET

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COLOSSAL.SET

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CYRILLIC.SET

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GRAPHIC.SET

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HEBREW.SET

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PINOCCHIO.SET

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| D | E | F | G | H | I | J | K | L | M | N |
| P | Q | R | S | T | U | V | W | X | Y | Z |
| \ |] | ^ | _ | ` | a | b | c | d | e | f |
| h | i | j | k | l | m | n | o | p | q | r |
| t | u | v | w | x | y | z | { | | } | ~ |

[illegible]

SLANT.SET

| | | | | | | | | | | | |
|---|---|---|----|---|---|---|---|---|---|---|---|
| / | " | # | \$ | % | & | ' | < | > | * | . | |
| , | - | . | / | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8 | 9 | : | ; | < | = | > | ? | * | A | B | C |
| D | E | F | G | H | I | J | K | L | M | N | O |
| P | Q | R | S | T | U | V | W | X | Y | Z | [|
| \ |] | ↑ | | | a | b | c | d | e | f | g |
| h | i | j | k | l | m | n | o | p | q | r | s |
| t | u | v | w | x | y | z | | | | | |

SMALL.SET

| | | | | | | | | | | | |
|---|---|---|----|---|---|---|---|---|---|---|---|
| ! | " | # | \$ | % | & | ' | (|) | * | + | |
| , | - | . | / | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8 | 9 | : | ; | < | = | > | ? | @ | A | B | C |
| D | E | F | G | H | I | J | K | L | M | N | O |
| P | Q | R | S | T | U | V | W | X | Y | Z | [|
| \ |] | ^ | _ | ` | a | b | c | d | e | f | g |
| h | i | j | k | l | m | n | o | p | q | r | s |
| t | u | v | w | x | y | z | { | | } | ~ | ■ |

STOP.SET

| | | | | | | | | | | | |
|---|---|---|----|---|---|---|---|---|---|---|---|
| ! | " | # | \$ | % | & | ' | (|) | * | + | |
| , | - | . | / | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8 | 9 | : | ; | < | = | > | ? | @ | A | B | C |
| D | E | F | G | H | I | J | K | L | M | N | O |
| P | Q | R | S | T | U | V | W | X | Y | Z | [|
| \ |] | ^ | _ | ` | a | b | c | d | e | f | g |
| h | i | j | k | l | m | n | o | p | q | r | s |
| t | u | v | w | x | y | z | { | | } | ~ | ■ |

Appendix B: Printing Graphics in Applesoft

The Printographer is a unique package in that, not only can you print out Hi-Res and Double Hi-Res graphics using the main program, but provisions have been made to print out graphics directly from within your own programs.

The file necessary to do this is the PRINT.GRAPHICS file created for your particular system by the CONFIGURE program. The general procedure is to:

1. Set start-of-program to decimal location 6144 (\$1800).
2. BLOAD PRINT.GRAPHICS, A\$800.

The routine is then called by Applesoft BASIC, CALL 2048 and use the built-in PRINT.GRAPHICS interface routine to pass the desired parameters in a manner consistent with normal Applesoft syntax.

The following is a sample Applesoft listing to give you some idea of how this all works.

NOTE #1: The PRINT.GRAPHICS routine is programmed to check the keyboard periodically for an the press of the ESCAPE key, which would indicate the user wanted to stop the printout process. It is important to note that the keyboard strobe is purposely *not cleared* by the read operation, so that the user program has the option of determining what the source of the termination was.

```
0 REM GRAPHIC.PRINT DEMO
10 IF PEEK(103) + PEEK(104) * 256 <> 6144 THEN POKE
    103,0:POKE 104,24:POKE 6143,0: PRINT CHR$(4)"RUN
    GRAPHIC.PRINT":REM RELOCATE PROGRAM
20 D$ = CHR$(4):REM CTRL-D
30 PRINT D$;"BLOAD PRINT.GRAPHICS,A$800"
40 PRINT D$;"BLOAD PICTURES/RAVEN,A$2000"
50 S=0:REM HIRES1
60 F=1:REM NORMAL
70 H=0:REM HORIZONTAL
80 M=1:REM MAGNIFICATION
90 I$="C":REM CENTER
```

```
100 BR=0:ER=191:BC=0:EC=279:REM SCREEN EDGES
110 CALL 2048,S,F,H,M,I$,BR,ER,BC,EC
120 END
```

This sample listing demonstrates a very short Applesoft program that makes use of the PRINT.GRAPHICS routine to print a Hi-Res picture. Note: If you choose to type this listing in, be very sure you save it first.

Line #10 protects the area for the PRINT.GRAPHICS routine by changing where the BASIC program loads in. With it moved up in memory to 6144 (\$1800), there's plenty of space for the machine language program PRINT.GRAPHICS at 2048 (\$800)

Line #20 initializes D\$ to CHR\$(4) so ProDOS will recognize our upcoming ProDOS commands.

Line #30 loads PRINT GRAPHICS into memory at the address normally reserved for the start of the BASIC program.

Line #40 then loads the Hi-Res picture RAVEN onto page 1 of the graphics display. If your program creates its own graphics pictures, then the graphics must be created prior to calling PRINT.GRAPHICS, as is done here on line #110.

Line #50 sets up the variable S to zero, because we want to print Hi-Res screen 1.

Line #60 initializes the variable I to zero so the graphic will be printed out Normal (as opposed to Inverse).

Line #70 sets up F to zero to print the picture Horizontally.

Line #80 initializes M to the magnification desired; here a 1.

Line #90 initializes I\$ to "C". This sets up PRINT.GRAPHICS to "center" the screen.

Line #100 sets up all the variables concerned with the edges of the screen. Beginning Row = 0. Ending Row = 199. Beginning Column = 0. Ending Column = 278. Set to these values, PRINT.GRAPHICS will do the whole screen.

Line #110 does the actual call to the PRINT.GRAPHICS routine by simply calling the address where PRINT.GRAPHICS was loaded, followed by a series of values or Applesoft variables that indicate how the picture should be printed. Notice that it is not necessary to turn the printer on and off with the usual PR#1, PR#0 type statements. All of this is handled by PRINT.GRAPHICS.

The general syntax for the PRINT.GRAPHICS call is:

CALL <load address>, Screen, Inking, Format, Magnification, Indentation,
Beginning Row, Ending Row, Beginning Column, Ending Column

Where each parameter position can be filled either with an Applesoft variable or expression, or a literal character sequence such as "HGR". The parameters are as follows:

Screen: Which Hi-Res display page to print.

| | | |
|----------------------|----|----------------------|
| HGR = Hi-Res page 1 | OR | 0 = Hi-Res page 1 |
| HGR2 = Hi-Res page 2 | | 1 = Hi-Res page 2 |
| | | 2 = Both pages - 1,2 |
| | | 3 = Both pages - 2,1 |

You can also use an arithmetic variable with a value of either 0, 1, 2 or 3, where 0 indicates Hi-Res page 1, and a 1 indicates page 2. If you set the variable to 2, BOTH Hi-Res pages will be printed side-by-side with page 1 on the left and page 2 on the right, in what is often called a "panorama" printing. A value of 3 specifies a panorama printing with page 2 on the left.

Inking: Normal is black background, Inverse gives a white background.

| | | |
|-------------|----|-------------|
| N = Normal | OR | 0 = Normal |
| I = Inverse | | 1 = Inverse |

Note: the letters N or I should not be used as a variable name to avoid conflict with the meaning of the letter N or I as used above.

Format: Whether to print the picture horizontally or vertically.

| | | |
|----------------|----|----------------|
| H = Horizontal | OR | 0 = Horizontal |
| V = Vertical | | 1 = Vertical |

Note: the letters H or V should not be used as a variable name to avoid conflict with the meaning of the letter H or V as used above.

Magnification: Value to use in enlarging the original image. Values here should range from 1 to 127.

Indentation: Number of dot positions to move the image to the right. See page 15 for more details. Range of values will depend on your particular printer. For left justification, centering or right justification the parameter should be a "L", "C", or "R" instead of an indentation value. An unrecognized character will result in left justification.

Note: the letters "L", "C", or "R" used here must be a letter between two quotes ("C") not just the letter like it has been used elsewhere.

Row; Beginning and Ending: Which horizontal row to begin and end the printout on. Equivalent to horizontal cropping. Values should be in the range of 0 to 159 (191 for full screen display).

Column; Beginning and Ending: Which vertical rows to begin and end the print-out on. Equivalent to vertical cropping. Values should be in the range of 0 to 279 (559 for Double Hi-Res).

It is not necessary to enter all the parameters. Any remaining values can always be defaulted on by omitting the rest of the sequence. Here's three good examples:

1. CALL <load address>, HGR2, I, V, "L", 50, 100

Print Hi-Res page two, inverse inking, vertically. Left justify, crop horizontally, start printing on row 50 and end on row 100; default is to print vertical columns 0 to 279.

2. CALL <load address>, HGR2, N, V

Print Hi-Res page two vertically with normal inking; default is to print entire screen, left justified.

3. CALL <load address>

Use all defaults when printing picture.

Note also that appropriate Applesoft variables or expressions can be used when defining the parameters. For example, this syntax is also acceptable:

```
CALL <load address>, P, I, V, LEFT$("LCR",1), X, Y
```

The Justification setting should be specified by a string variable. All other settings should be specified by numeric variables.

Memory Map, Applesoft BASIC with PRINT GRAPHICS:

| ----- | | | | | | |
|-------|----------------|-------|----------------|---|--------|---------------|
| | | | FP | | | |
| | PARAM PRINT | BASIC | <-VARIABLES--> | | | |
| | BLOCK GRAPHICS | PROG. | | | PRODOS | MONITOR |
| ----- | | | | | | |
| ^ | ^ | ^ | ^ | ^ | ^ | ^ |
| \$0 | \$300 | \$800 | \$1800 | | \$9600 | \$C000 \$FFFF |
| = | --- | ---- | Start Of | | ----- | ----- |
| 0 | 768 | 2048 | Program | | 38400 | 49152 65535 |
| | | | ==== | | | |
| | | | 6144 | | | |

Printing Graphics From Applesoft With The Toolbox Series

```
0 REM TOOLBOX GRAPHIC PRINTER
1 CALL PEEK (175) + PEEK (176) * 256 - 46
10 D$ = CHR$(4): REM CTRL-D
30 PRINT D$;"BLOAD PICTURES/RAVEN,A$2000"
40 &"PRINT",HGR,I,H,1,"C",0,191,0,279
50 END
```

The main difference in this program is that another Applesoft programming utility, "The Toolbox Series", has been used to eliminate the concern over the placement and loading of the PRINT.GRAPHICS file.

The Toolbox Series is a programming tool produced by Roger Wagner Publishing that allows even a novice programmer to put almost an unlimited

number of machine language routines in any Applesoft program, and then call them via the ampersand (&) and a function name, without having to be aware of memory allocation or machine language programming techniques.

For those using a Toolbox, PRINT.GRAPHICS may be added and used just like any other command with the ADD A COMMAND function of The Workbench in The Toolbox Series.

Note that line #1 is generated automatically by The Toolbox and need not be entered by the user. This program is *not* included on the Printographer diskette as a demo program.

Because the PRINT.GRAPHICS routine is location independent machine language code, it can be put anywhere in Apple's memory that will not conflict with other operations. The easiest way to do this is with The Toolbox Series.

However, not everyone has The Toolbox Series. For those who don't, a sample program (LOAD.PRINT) has been provided as a demonstration tool. Load it, run it, and list it. You can even re-write it into the program of your dreams if you desire...

Printing Graphics from Assembly Language

Syntax has even been provided to allow the PRINT.GRAPHICS subroutine to print parts of the graphics screens from Machine Language. The routines are fully relocatable and the exact length depends on the printer driver configured. This length is usually in the range of 3700 to 4100 bytes. Parameters to the routine are passed in memory page three. The parameters, their addresses and functions are described below.

High-Res Page 768 (\$300)

Set to zero if page one (\$2000-\$3FFF) is to be printed.

Set to one if page two (\$4000-\$5FFF) is to be printed.

Set to two if page one and two (\$2000-\$5FFF) are to be printed side-by-side.

Set to three if page two and one (\$2000-\$5FFF) are to be printed side-by-side.

Inking

769 (\$301)

Set to zero for a black background and white dots.
Set to one for a white background and black dots.

Indentation

770 (\$302) least significant byte
771 (\$303) most significant byte

This location contains a two-byte integer specifying the number of graphic columns the picture is to be indented.

To obtain The Prinographer justification functions, location 771 (\$303) should have an ASCII character with the high bit (bit 7) set stored in it. "L" causes left justification, "C" will center the picture, and "R" will cause right justification.

NOTE: If you forget to set the high bit, PRINT.GRAPHICS will treat the parameter as a very large indentation value!

Magnification

772 (\$304)

Bit seven of this byte is the format selector. When equal to zero (mag. < 128), the picture will be printed in a horizontal format. When bit seven is one (mag. > 127) the picture will be printed rotated 90 degrees to a vertical format.

Bits six through zero contain the enlargement specification. The size of the picture will be magnified by the factor specified by this field for all horizontal pictures (mag. < 128). For vertical formats (mag. > 127) the magnification will be equal to the value of the contents of \$304 minus 128.

Top Row

773 (\$305)

Bottom Row

774 (\$306)

These parameters select the top and bottom borders of the picture to be printed.

Left Column

775 (\$309) least significant byte
776 (\$308) most significant byte

Right Column

777 (\$309) least significant byte
778 (\$30A) most significant byte

These parameters select the left and right borders of the picture to be printed. They are both two-byte integers.

When calling the routine, the proper entry point is at the load address plus seven bytes. For example, if the routine was located at \$8000, you should load the parameter block on page 3 of memory (\$300+) and then execute a JMP \$8007 to properly execute the routine.

Loading & Saving Compressed Graphics Files

Because the Apple does not have an intrinsic ability to load or save compressed files, two additional utilities are included on The Printographer diskette, COMPRESS.TB and UNCOMPRESS.TB.

These are both location independent machine language routines, similar to PRINT.GRAPHICS in that they are designed to be used by an Applesoft program by a CALL, or via The Toolbox. If you do not have The Toolbox, you should BLOAD the files into a protected part of memory. The syntax for calling the routines is:

COMPRESS: CALL <load address>,"FILE NAME",P
UNCOMPRESS: CALL <load address>,"FILE NAME"

COMPRESS has one additional variable; the P. This specifies exactly how you want to save the picture.

| P | Action |
|---|-----------------------------------|
| 0 | Normal Uncompressed Hi-Res |
| 1 | Compressed Hi-Res |
| 2 | Normal Uncompressed Double Hi-Res |
| 3 | Compressed Double Hi-Res |

Both of these routines will load or save a \$08 (FOT) type compressed picture file, of the name "FILE NAME", onto or from page 1 of the Hi-Res or Double Hi-Res display. Note that loading and saving use all of Page 2. When saving a file, the routine will set the auxtype of the file to \$8001 for the compressed Hi-Res pictures, and \$8002 for the Double Hi-Res pictures.

Any disk errors (FILE NOT FOUND, etc.) during disk access will occur exactly as normal. The errors will be found in PEEK(222) using standard ProDOS BASIC error codes.

If the load or save routines do not have sufficient room to operate, the standard Applesoft "OUT OF MEMORY" error will be generated, which should be handled by the usual error trapping methods you would otherwise use in your program.



Quick Reference

The Printographer Command Summary

Picture Cropping Commands

| | |
|------------|---|
| A | Add Text to Picture |
| B | Toggle Background Color for Diamond & Oval Cropping |
| D | Form Diamond Shape |
| F | Fast Cursor Movement (Cancel with any non-cursor key) |
| I | Move Marker Up |
| J | Move Marker Left |
| K | Move Marker Right |
| M | Move Marker Down |
| O | Form Oval Shape |
| P | Print Picture |
| R | Restore Original Picture |
| S | Save Picture |
| Arrow Keys | Move Markers |
| Escape | Return to Main Menu |
| Space Bar | Switch Between Upper & Lower Markers |
| Return | View Picture |
| ? | View Cropping Help Screen |

Adding Text Commands

| | |
|------------|--------------------------------------|
| I | Move Text Cursor Up |
| J | Move Text Cursor Left |
| K | Move Text Cursor Right |
| M | Move Text Cursor Down |
| Control-A | Alternate Character Set |
| Control-D | Change Text Direction |
| Control-F | Toggle Fast Cursor Motion |
| Control-I | Toggle Inverse Characters |
| Control-L | Load Alternate Character Set |
| Control-R | Restore Picture Under Cursor |
| Control-S | Shift Upper/Lower Case |
| Control-T | Turn Direction of Text Characters |
| Arrow Keys | Move Text Cursor |
| Space | Start Typing Text |
| Escape | Return to Picture Cropping Menu |
| Return | Move Text Cursor to Next Screen Line |
| ? | View Adding Text Help Screen |



Picture Printing Commands

| | |
|-----------|---|
| Escape | Return to Main Menu |
| Control-P | Pause Printing (Any key to resume printing) |
| Space | Return to Printing Menu After Printout |

Startup Commands *

| | |
|---|--|
| C | Starts CONFIGURE Program Instead of The Printographer |
| L | Starts Lo-Res Converter Program Instead of The Printographer |

- * To use the startup commands shown above, start The Printographer diskette and press the desired key as soon as the red disk drive light comes on.



